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What is Claimed is:

1. A hard carbon material having a density greater than 2.3 g/cm^3 formed by the process of:

a) providing a fullerene based carbon powder,

b) agglomerating said fullerene based carbon powder to a density above 1.4 g/cm^3;

c) subjecting said fullerene based carbon powder to a pressure of 1.0 to 10.0 Gpa, a temperature of from 300-1000°C for a period of time from 1 to 10000 seconds.

2. The carbon material as claimed in claim 1, wherein the fullerene based powder comprises at least 99% buckyballs.

3. The carbon material as claimed in claim 1, wherein the fullerene based powder comprises at least 99% single walled nanotubes.

4. The carbon material as claimed in claim 1, wherein the fullerene based powder comprises at least 99.9% fullerenes.

5. The carbon material as claimed in claim 1, wherein the pressure is at least 2.5 GPa, the temperature is at least 500°C, and the period of time is at least 1000 seconds.

6. The carbon material as claimed in claim 1, wherein the fullerene based powder comprises 0.0001 to 1.0% of a dopant.

7. The carbon material as claimed in claim 6, wherein the dopant is selected from the group consisting of hydrogen, boron, nitrogen, oxygen, sulphur, fluorine, and chlorine.

8. A process for forming a hard high density sintered conductive carbon material, comprising the steps of:

a) providing an fullerene based carbon powder having at least 99% fullerenes,

b) agglomerating said fullerene based carbon powder to a density above 1.4 g/cm^3;

c) subjecting said fullerene based carbon powder to pressure of 1.0 to 10.0 Gpa, a temperature of from 300-1000°C for a period of time of from 1 to 10000 seconds.

9. The process as claimed in claim 8, wherein the fullerene based powder comprises at least 99.9% by weight of single walled nanotubes.

10. The process as claimed in claim 8, wherein the fullerene based powder comprises at least 99.9% by weight of buckyballs.

11.The process as claimed in claim 10, further including the steps of d) providing an alloy used to convert carbon materials to diamond and e) subjecting said sintered carbon material to a pressure of 7.0 to 9.0 Gpa, a temperature of from 800-1300°C for a period of time from 0.1 to 100 seconds to convert the sintered carbon material to polycrystalline diamond.

12. The process as claimed in claim 11, wherein the alloys are based on at least one of

Ni, Fe and Co.

13. The process as claimed in claim 10, further including the steps of d) providing a metal alloy selected form the group comprising aluminum, magnesium and calcium alloys and e) subjecting said sintered carbon material to a pressure of 2.5 to 9.0 Gpa, a temperature of from 400-1300°C for a period of time from 10 to 1000 seconds to convert the sintered carbon material to monocrystalline diamond.

14. The process as claimed in claim 8, further including the steps of infiltrating said fullerenes by superplastic flow under temperature and pressure into a porous composite material and said subjecting step takes place after said fullerene based carbon powder has been infiltrated into the porous material.

15. The process as claimed in claim 14, wherein the superplastic flow takes place at temperatures of 200-400°C at pressures of 0.1-1.0 Gpa.

16. The process as claimed in claim 8, wherein the fullerene based carbon powder comprises 0.0001 to 1.0% of a dopant.

17. A conductive hard, high density carbon material comprising fullerenes subjected to heat, temperature and pressure sufficient to provide a hardness to the material of at least 1.0 Gpa and a resistivity of less than 10 ohms-cm and a density above 2.3 g/cm^3.

18. The process as claimed in claim 17, wherein the fullerenes comprise at least 99.9%

by weight of single walled nanotubes.

19. The process as claimed in claim 17, wherein the fullerenes comprise at least 99.9% by weight of buckyballs.